

CLAIMS

1. A process for producing a carbonyl compound, comprising allowing water to undergo phase transition to a supercritical or subcritical state in the presence of an alcohol compound to produce/generate water-derived hydrogen and at the same time convert the alcohol compound into a corresponding carbonyl compound.
2. A process for generating water-derived hydrogen, comprising bringing water into a critical state in the presence of a secondary alcohol.
3. The process according to claim 2, wherein the process is carried out by introducing the secondary alcohol in a reaction tube along with water and heating and/or pressurizing the mixture of the alcohol and the water to bring the water into the supercritical state.
4. The process for producing hydrogen according to claim 2 or 3, wherein the phase transition of the water to the supercritical or subcritical state is carried out in an oxygen-free environment.
5. The process for producing hydrogen according to claim 4, wherein the oxygen-free state is established by removing oxygen from the atmosphere in the reaction system.
6. The process for producing hydrogen according to claim 4, wherein the oxygen-free state is established by using deoxygenated water.
7. The process for producing hydrogen according to claim 4, wherein the oxygen-free state is established by removing oxygen from the atmosphere in the reaction system while using deoxygenated water.
8. A novel process for producing a carbonyl compound, comprising reacting a primary or secondary alcohol with subcritical or supercritical water to convert the alcohol into a carbonyl

compound.

9. The process according to claim 8, wherein the process is carried out by introducing the primary or secondary alcohol in a reaction tube along with water and heating and/or pressurizing the 5 mixture of the alcohol and the water to bring the water into the subcritical or supercritical state.

10. The novel process for producing a carbonyl compound according to claim 8 or 9, wherein the reaction of the primary alcohol or the secondary alcohol with the subcritical or 10 supercritical water is carried out in an oxygen-free environment.

11. The novel process for producing a carbonyl compound according to claim 10, wherein the oxygen-free state is established by removing oxygen from the atmosphere in the reaction system.

12. The novel process for producing a carbonyl compound 15 according to claim 10, wherein the oxygen-free state is established by using deoxygenated water as the water to be brought into the subcritical or supercritical state.

13. The novel process for producing a carbonyl compound according to claim 10, wherein the oxygen-free state is established 20 by removing oxygen from the atmosphere in the reaction system while using deoxygenated water as the water to be brought into the subcritical or supercritical state.